EXERCICE 1

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Q1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DESIGN | Memory efficiency | Computational efficiency | Simplicity | Maintainability |
| Design 2 | Design 2 and 3 will take less memory | Design 2 and 3 will take less time if we don’t ask to compute for the other type coordinate | Design 2 is simple but just for one type of coordinate | Design 2 is not easy to update and to understand for others |
| Design 3 | Design 2 and 3 will take less memory | Design 2 and 3 will take less time if we don’t ask to compute for the other type coordinate | Design 3 is simple but just for one type of coordinate | Design 3 is not easy to update and to understand for others |
| Design 5 | Design 5 will have a good memory usage since we need to handle one coordinate at the time(Pointcp3 or Pointcp2) | Design 5 will take less time than original design | Design 5 is as simple as the two other design but for all types of coordinates | Design 5 has the best maintainability overall since the types of coordinates are separated |

When running the two programs, test for PointCP and test1 for PointCP5(all programs create a point instance and call one method in a loop during a certain time) we can slightly see that design 5 is a little faster than design 1. You can see that in the two next table. The second table is a statistic about the number of points I created in 10 sec(minimum , maximum and median)

|  |  |  |
| --- | --- | --- |
| Time(seconds) | Number of points created | |
| Design 1 | Design 5 |
| 1 | 9685102 | 9114994 |
| 3 | 26205449 | 27239635 |
| 5 | 45302150 | 48038376 |
| 10 | 89055748 | 101755855 |

|  |  |  |  |
| --- | --- | --- | --- |
| (over 10 sec) | minimum | median | Maximum |
| Design 1 | 88042749 | 99568990 | 101637726 |
| Design 5 | 89719108 | 98180589 | 101755855 |

We can therefore conclude that design 5 is better than design 1